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09/502,454	02/11/2000	Naoki Soeda	F-9680	5175

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EXAMINER

CHEN, TIANJIE

ART UNIT

PAPER NUMBER

2652

DATE MAILED: 03/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/502,454

Applicant(s)

SOEDA, NAOKI

Examiner

Tianjie Chen

Art Unit

2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3-5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The terms "poor" and "superior" in claims 1-6, 8-12, 14, and 15 are relative terms, they render the claim indefinite. The terms "poor" and "superior" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Therefore the magnitude of the noise in the claim is not well defined.
- The parent claim 4 recites that the interface control circuit is mounted on the second printed circuit board, but claim 13 recites "the second printed-circuit board does not mount an interface control circuit." The claim 3 causes confusion about the position of the interface control circuit and renders claim 13 indefinite.
- Claims 7 and 13 are also rejected for their dependence from claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takao et al (JP 5-81848A). ⁶

With regard to claim 1, Takao et al shows a magnetic disk apparatus in Fig. 1 including: a disk enclosure in 2a, a first printed-circuit board 2a, which is paired with the disk enclosure, and a second printed-circuit board 2b, which is connected to the first printed circuit board 2a via connectors 3a and 3b ([0011] in English translation, attached) and is separated in structure from the first printed-circuit board (Fig. 12); wherein the first printed-circuit board mounts circuits including motor drive 10 and voice coil motor drive 9 ([0016]) which generates noise, and a circuit 24 which holds parameters unique to the disk enclosure ([0015]); and wherein the second printed circuit board 2b mounts circuits which does not generate too much noise since it consists electronic logic circuit, which deals with weak signals and is sensitive to the noise.

Takao et al does not show that the second printed-circuit board is connected to the first printed circuit board via cable between the connectors.

Official Notice is taken: using a cable to connect a second printed-circuit board, which is usually in the main frame of a computer, with a first printed-circuit board,

which is usually a disk drive, is a notoriously old and common practice in the art for connecting an external drive to a computer.

It would have been obvious at the time the invention was made to one of ordinary skill to use a cable to connect a second printed-circuit board with a first printed-circuit board. The rationale is as follows: using a cable to connect a second printed-circuit board with a first printed-circuit board would make the computer being able to accept an external disk drive, thus expanding the capacity of the device. One of ordinary skill in the art would have been motivated to use a cable to connect a second printed-circuit board with a first printed-circuit board, thus making the computer being able to accept an external disk drive, thus expanding the capacity of the device.

With regard to claim 2, Takao et al further shows that the first printed circuit board includes recording/reproduction control circuit 7 ([0014]).

With regard to claim 3, Takao et al shows an apparatus as described above, but does not explicitly show that circuit board 2a has an analog/digital converter.

But Takao et al shows that signal is read from the head by circuit 7 (line 1 in [0014]) and delivered to a logic operation circuit 6 (line 2 in [13]).

It would have been obvious to provide an analog/digital converter in circuit board 2a. The rationale is as follows: the logic operation circuit deals with digital signals, the signals read from the head are analog. Therefore, an analog/digital converter in 2a is a necessity to convert the analog signals from 7 into digital signals, then feeding it into the logic operation circuit 6 through the connectors 3a and 3b. One of ordinary skill in the art would have been expecting an analog/digit converter in the circuit board 2a for feeding digit signals into the logic operation circuit.

With regard to claim 4, Takao further shows that the second printed circuit board includes an interface control circuit 5 ([0013]) with an upper system – the computer.

With regard to claim 5, Takao et al further shows that the circuits on the second printed-circuit board include a processor 4 and 6 ([0013]).

With regard to claim 6, Takao et al further shows that the circuits on the second printed-circuit board include a spindle motor/voice coil motor control circuit ([0027]).

With regard to claim 7, Takao et al further shows that the first printed-circuit board further mounts a connector, which inherits some degree of elasticity.

With regard to claim 8, Takao et al shows that the circuits on the second printed-circuit board include a spindle motor/voice coil motor control circuit ([0027]).

With regard to claim 9, Takao et al shows that the circuits on the second printed-circuit board further include a single processor 4 and 6 ([0030]).

With regard to claim 10, Takao et al further shows that the circuits on the second printed-circuit board include an interface circuit 5 ([0030]) with an upper system.

With regard to claim 11, Takao et al shows computer having a first group (one of 2a in Fig. 12) consisting of one disk enclosure and one first printed-circuit board and a second group (another one of 2a in Fig. 12) consisting of another disk enclosure and another first printed-circuit board; and in inherent switch for selecting either of the first group or the second group to be communicated.

With regard to claim 12, Takao et al shows that the second printed-circuit board is separated into a third printed circuit board 5 and a fourth printed circuit 6;

wherein the third printed circuit board mounts the interface control circuit 5 and wherein the fourth printed circuit board mounts the logic calculation circuits 6.

Takao et al does not show that the circuits on the fourth printed circuit board is better in noise resistance than the interference control circuit.

But it would have been obvious at the time the invention was made to one of ordinary skill to expect that in Takao et al's device that the circuits on the fourth printed circuit board is better in noise resistance than the interference control circuit. The rationale is as follows: the interface control unit works with a current, which is much larger than the current in the logic operation circuit. And the logic operation circuit is much sensitive to the noise, because even a low level noise can cause miscalculation in the logic operation circuit. One of ordinary skill would have been motivated to make the fourth printed circuit board is better in noise resistance than the interference control circuit in order to ensure the logic operation circuit working properly.

With regard to claim 13, Takao shows that the circuits on the second printed-circuit board include an interface control circuit 5 ([0013]) with an upper system – the computer.

With regard to claim 14, Takao et al shows that the circuits on the second printed-circuit board include a processor 4 and 6 ([0013]).

With regard to claim 15, Takao et al shows that the circuits on the second printed-circuit board include a spindle motor/voice coil motor control circuit ([0027]).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US005282099 to Kawagoe et al shows a disk drive with two printed-circuit boards.


US006307743 to Aizawa et al shows a disk drive with printed circuit board.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is (703) 305-7499. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on (703) 305-9687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

TC
March 20, 2002



BRIAN E. MILLER
PRIMARY EXAMINER